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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/650,969	08/29/2000	Robert L. Thornton	SIROS-020	8650

7590

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EXAMINER

MONBLEAU, DAVIENNE N

ART UNIT PAPER NUMBER

2828

DATE MAILED: 04/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

09/650,969

Applicant(s)

THORNTON ET AL.

Examiner

Davienne Monbleau

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.


- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 August 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

  
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**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: \_\_\_\_\_

Art Unit: 2828

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The IDS filed on 4/9/01 has been acknowledged and a signed copy of the PTO-1449 is attached herein.

### ***Specification***

On page 50 line 12, should "Figure 28" – be changed to – "Figure 29"? *OK*

### ***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Figure 29 does not have reference number 118. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. *OK*

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding Claims 1, 9, 19 and 20, there is a lack of structural support in the

Art Unit: 2828

claims. What exactly is the device/apparatus? Simply stating there is a layer with a specific type of aperture does not provide sufficient structural support. Furthermore, what is defined by a protrusion? In what direction is it protruding into said aperture? ✓

Further regarding Claims 7, 8, 15 and 16, if said protrusion(s) is/are part of said conductive plane, how can it/they be electrically isolated from said conductive plane?

Further regarding Claims 9 and 17, the phrase "associated with" is indefinite. Is it on top of, attached to, underneath, etc.? ✓

Regarding Claims 18 and 30, the term "adjacent" is vague. Is it on top of, attached to, underneath, etc.?

Claim 20 recites the limitation "said transverse slot" in line 3. There is insufficient antecedent basis for this limitation in the claim. ✓

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-29, to the extent taught and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Claisse et al. (U.S. Patent No. 6,084,900) in view of Sun et al. (U.S. Patent No. 5,915,165). Regarding Claim 1, Claisse et al. teach in Figure 2 an optical apparatus comprising a conductive plane (30) having an aperture (51). Claisse et al. do not teach a protrusion. Sun et al. teach in Figure 6 that multiple aperture shapes are known in the art. It

would have been obvious to one of ordinary skill in the art at the time of the invention to alter the aperture shape in Claisse et al., as taught by Sun et al., to limit the light emission to a particular mode. Adding a protrusion would alter said shape of the aperture.

Regarding Claim 9, Claisse et al. teach in Figure 2 an optical apparatus comprising a light source (22) and a conductive plane (30) having an aperture (51). Claisse et al. do not teach a protrusion. Sun et al. teach in Figure 6 that multiple aperture shapes are known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to alter the aperture shape in Claisse et al., as taught by Sun et al., to limit the light emission to a particular mode. Adding a protrusion would alter said shape of the aperture.

Regarding Claims 2-8 and 10-16, determining the exact size and shape of the aperture is optimization and involves routine skill in the art.

Regarding Claim 17, it is known in the art that metal may be used as a conductive layer.

Regarding Claim 18, Claisse et al. further teach an active region (22), a first reflective region (26) and a second reflective region (14), wherein said conductive layer (30) is adjacent an outer surface of said first reflective region.

Regarding Claim 19, Claisse et al. teach in Figure 2 a semiconductor laser apparatus comprising an emission facet having a conductive surface (30), wherein said conductive surface has an aperture (51) therein. Claisse et al. do not teach a protrusion. Sun et al. teach in Figure 6 that multiple aperture shapes are known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to alter the aperture shape in Claisse et al., as taught by Sun et al., to limit the light emission to a particular mode. Adding a protrusion would alter said shape of the aperture.

Art Unit: 2828

Regarding Claim 20, Claisse et al. teach in Figure 2 an optical apparatus comprising a conductive plane (30) having an aperture (51). Claisse et al. do not teach slots in said aperture. Sun et al. teach in Figure 6 that multiple aperture shapes are known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to alter the aperture shape in Claisse et al., as taught by Sun et al., to limit the light emission to a particular mode. Adding slots would alter said shape of the aperture.

Regarding Claims 21-29, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine the relative length, width and location of said slots and connector regions since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 30-44, to the extent taught and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's admitted Prior Art Figure 27 in view of Claisse et al. (U.S. Patent No. 6,084,900) and Sun et al. (U.S. Patent No. 5,915,165). Regarding Claim 30, Prior Art Figure 27 teaches a semiconductor laser comprising a laser active region (112), a first reflective region (116), a second reflective region (118) and an emission face (134) comprising a reflective conductive layer (138). Prior Art Figure 27 does not teach an aperture extending into said first reflective region. Claisse et al. teach in Figure 2 a semiconductor laser comprising an aperture (51) extending through a first reflective region (26). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the aperture in Prior Art Figure 27, as taught by Claisse et al., to provide a stable single high order mode laser source. Prior Art Figure 27 does not teach a protrusion. Sun et al. teach in Figure 6 that multiple aperture shapes

Art Unit: 2828

are known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to alter the aperture shape in Prior Art Figure 27 in view of Claisse et al., as taught by Sun et al., to limit the light emission to a particular mode. Adding a protrusion would alter said shape of the aperture.

Regarding Claim 37, Prior Art Figure 27 teaches a semiconductor laser comprising a laser active region (112), a first conductivity type upper reflective region (116), a second conductivity type lower reflective region (118) and an emission face (134). Prior Art Figure 27 does not teach an aperture extending into said first reflective region. Claisse et al. teach in Figure 2 a semiconductor laser comprising an aperture (51) extending through a first reflective region (26). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the aperture in Prior Art Figure 27, as taught by Claisse et al., to provide a stable single high order mode laser source. Prior Art Figure 27 does not teach the aperture size. Sun et al. teach in Figure 6 that multiple aperture shapes are known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to alter the aperture shape in Prior Art Figure 27 in view of Claisse et al., as taught by Sun et al., to limit the light emission to a particular mode.

Regarding Claim 31, determining the exact size and shape of the aperture is optimization and involves routine skill in the art.

Regarding Claim 32, Prior Art Figure 27 teaches that said reflective regions have a plurality of distributed Bragg mirrors.

Regarding Claims 33, 34 and 41, Claisse et al. teaches that an area under said aperture has a smaller number of mirrors and lower reflective than does an area surrounding said aperture.

Art Unit: 2828

Regarding Claims 35, 36, 39 and 40, semiconductor contact layers and oxide layers are well known in the art.

Regarding Claim 38, see discussion on Claim 30.

Regarding Claim 42, Prior Art Figure 27 teaches that said upper reflective region comprises a plurality of p-doped quarter wave layer pairs (120) and that said lower reflective region comprises a plurality of n-doped quarter wave layer pairs (120).

Regarding Claim 43, see discussion on Claim 33.

Regarding Claim 44, determining the exact size and shape of the aperture is optimization and involves routine skill in the art.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Adams et al. (U.S. Patent No. 6,061,381) teach in Figure 1 a semiconductor laser comprising an aperture (D) in a reflective region (11 and 12). Ueki (U.S. Patent No. 6,320,893) teaches in Figure 5a-5e various aperture shapes for a semiconductor laser. Shieh et al. (U.S. Patent No. 5,838,705) teach in Figure 2 a semiconductor laser comprising an aperture (233), an insulative layer (245), a conductive layer (243) and a reflective region (240).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davienne Monbleau whose telephone number is 703-306-5803. The examiner can normally be reached on Mon-Fri 10:00 am to 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on 703-308-3098. The fax phone numbers for the



Art Unit: 2828

organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

*Darienne Monbleau*

DNM

April 9, 2002

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